

Appln. No. 09/736,076  
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Amendments to the Claims:

This listing of the claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1 (Currently Amended). A method according in accordance with Claim 42, wherein peptide comprising a peptide derivative of the HJ loop of a serine/threonine kinase, wherein:

a) said peptide has between about five and about twenty amino acids or amino acid analogs, said peptide modulates activity of the serine/threonine kinase, and said peptide is cyclic.

b) said peptide modulates activity of the serine/threonine kinase, and

c) said peptide is cyclic.

2 (Currently Amended). A method in accordance with Claim 42, wherein peptide comprising a peptide derivative of the HJ loop of a serine/threonine kinase, wherein:

a) said peptide has between about five and about twenty amino acids or amino acid analogs,

b) said peptide modulates the activity of the serine/threonine kinase, and

c) said peptide has an N-terminus and a C-terminus which are unsubstituted.

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3 (Currently Amended). A method in accordance with  
Claim 42, wherein said peptide which is an amino acid sequence  
or a subsequence of an HJ loop of a serine/threonine kinase,  
with the proviso that any one amino acid in the sequence of  
the peptide derivative can vary, being any amino acid or  
analog thereof.

4 (Currently Amended). A method in accordance with  
Claim 42, wherein peptide comprising a peptide derivative of  
the HJ loop of a serine/threonine kinase, wherein:  
\_\_\_\_ a) said peptide has between about five and about  
twenty amino acids or amino acid analogs;  
\_\_\_\_ b) said peptide modulates activity of the  
serine/threonine kinase; and  
\_\_\_\_ c) the serine/threonine kinase is member of a  
serine/threonine kinase family selected from the group of  
families consisting of Raf, mitogen-activated protein kinases  
(MAP kinases), G protein-coupled receptor kinases, or the  
serine/threonine kinase is selected from the group consisting  
of protein kinase C, cyclic AMP dependent kinase, calmodulin  
dependent kinase, cyclic GMP dependent protein kinase, Akt/PKB  
and GSK3.

5 (Currently Amended). The method peptide of Claim  
4 wherein the serine/threonine kinase is from the Raf family

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and is selected from the group consisting of Raf-1, A-Raf and B-Raf.

6 (Currently Amended). The method peptide of Claim 4 wherein the serine/threonine kinase is a G-protein dependent kinase selected from the group consisting of P2-adrenergic receptor kinases, rhodopsin kinase and GRK4-6.

7 (Currently Amended). A method in accordance with Claim 42, wherein said peptide has having the sequence of HJ-38 (SEQ ID NO.: 13), J-41 (SEQ ID NO.: 14), J-47 (SEQ ID NO.: 20), J-48 (SEQ ID NO.: 21), J-29 (SEQ ID NO.: 22), K014H010 (SEQ ID NO.: 63), K014H111 (SEQ ID NO.: 64), K048H901 (SEQ ID NO.: 66), K098H901 (SEQ ID NO.: 67), or K107H901 (SEQ ID NO.: 68).

8 (Currently Amended). A method in accordance with Claim 42, wherein said peptide has having the sequence of HJ-38 (SEQ ID NO.: 13), J-41 (SEQ ID NO.: 14), J-47 (SEQ ID NO.: 20), J-48 (SEQ ID NO.: 21), J-29 (SEQ ID NO.: 22), K014H010 (SEQ ID NO.: 63), K014H111 (SEQ ID NO.: 64), K048H901 (SEQ ID NO.: 66), K098H901 (SEQ ID NO.: 67), or K107H901 (SEQ ID NO.: 68), with the proviso that any one amino acid residue in the peptide can vary, being any naturally occurring amino acid or analog thereof.

9 (Currently Amended). A method in accordance with Claim 42, wherein said peptide comprises comprising a sequence

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of amino acids AA<sub>1</sub> through AA<sub>20</sub> or a subsequence thereof comprising at least five amino acids, wherein:

AA<sub>1</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan;

AA<sub>2</sub> is selected from the group consisting of glutamine, asparagine, glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>3</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>4</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>5</sub> is selected from the group consisting of alanine, serine and threonine;

AA<sub>6</sub> is glycine or alanine;

AA<sub>7</sub> is selected from the group consisting of glutamic acid, aspartic acid and an aliphatic, substituted aliphatic benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>8</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>9</sub> is proline;

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AA<sub>10</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan;

AA<sub>11</sub> is selected from the group consisting of alanine, serine and threonine;

AA<sub>12</sub> is selected from the group consisting of histidine, asparagine, glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>13</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>14</sub> is selected from the group consisting of asparagine, glutamine, glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>15</sub> is selected from the group consisting of asparagine, glutamine, glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>16</sub> is selected from the group consisting of arginine, N-nitroarginine,  $\beta$ -cycloarginine,  $\gamma$ -

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hydroxyarginine, N-amidinocitruline and 2-amino-4-  
guanidinobutanoic acid;

AA<sub>17</sub> is selected from the group consisting of  
asparagine, glutamine, glutamic acid, aspartic acid and an  
aliphatic, substituted aliphatic, benzyl, substituted benzyl,  
aromatic or substituted aromatic ester of glutamic acid or  
aspartic acid;

AA<sub>18</sub> is selected from the group consisting of  
asparagine, glutamine, glutamic acid, aspartic acid and an  
aliphatic, substituted aliphatic, benzyl, substituted benzyl,  
aromatic or substituted aromatic ester of glutamic acid or  
aspartic acid;

AA<sub>19</sub> is selected from the group consisting of  
leucine, isoleucine, methionine and valine; and

AA<sub>20</sub> is selected from the group consisting of  
leucine, isoleucine, methionine and valine.

| 10 (Currently Amended). The method peptide of Claim  
9 wherein the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence  
thereof corresponds to the sequence of the HJ loop of Raf (SEQ  
ID NO.: 1) or a subsequence thereof, with the proviso that any  
two amino acids in the sequence AA<sub>1</sub> through AA<sub>20</sub> or the  
subsequence thereof can vary.

| 11 (Currently Amended). The method peptide of Claim  
9 wherein the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence

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thereof corresponds to the sequence or a subsequence of the HJ loop of Raf (SEQ ID NO.: 1), with the proviso that any one amino acid in the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence thereof can vary.

12 (Currently Amended). The method peptide of Claim 10 or Claim 11 wherein the peptide comprises an eight amino acid subsequence of the sequence A<sub>4</sub> AA<sub>1</sub> through AA<sub>20</sub>, wherein the subsequence is selected from the group consisting of AA<sub>3</sub> through AA<sub>10</sub>, AA<sub>7</sub> through AA<sub>14</sub>, and AA<sub>11</sub> through AA<sub>18</sub>.

13 (Currently Amended). A method in accordance with Claim 42, wherein said peptide comprises comprising a sequence of amino acids AA<sub>1</sub> through AA<sub>20</sub> or a subsequence thereof comprising at least five amino acids, wherein:

AA<sub>1</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan;

AA<sub>2</sub> is selected from the group consisting of glutamine, asparagine, glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>3</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>4</sub> is alanine or glycine;

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AA<sub>5</sub> is selected from the group consisting of alanine, leucine, isoleucine, methionine and valine;

AA<sub>6</sub> is glycine or alanine;

AA<sub>7</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan;

AA<sub>8</sub> is proline;

AA<sub>9</sub> is proline;

AA<sub>10</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan;

AA<sub>11</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan;

AA<sub>12</sub> is glycine or alanine;

AA<sub>13</sub> is selected from the group consisting of glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>14</sub> is selected from the group consisting of asparagine, glutamine, glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>15</sub> is proline;

AA<sub>16</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

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AA<sub>17</sub> is selected from the group consisting of asparagine, glutamine, glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>18</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>19</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan; and

AA<sub>20</sub> is selected from the group consisting of glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid.

14 (Currently Amended). The method peptide of Claim 13 wherein the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence thereof corresponds to the sequence of the HJ loop of cyclic AMP dependent kinase (SEQ ID NO.: 2) or a subsequence thereof, with the proviso that any two amino acids in the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence thereof can vary.

15 (Currently Amended). The method peptide of Claim 13 wherein the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence thereof corresponds to the sequence or a subsequence of the HJ loop of cyclic AMP dependent kinase (SEQ ID NO.: 2), with the

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proviso that any one amino acid in the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence thereof can vary.

16 (Currently Amended). The method peptide of Claim 14 or Claim 15 wherein the peptide comprises an eight amino acid subsequence of the sequence AA<sub>4</sub> AA<sub>1</sub> through AA<sub>20</sub>, wherein the subsequence is selected from the group consisting of AA<sub>3</sub> through AA<sub>10</sub>, AA<sub>7</sub> through AA<sub>14</sub> and AA<sub>11</sub> through AA<sub>18</sub>.

17. A method in accordance with Claim 42, wherein said peptide comprises comprising a sequence of amino acids AA<sub>1</sub> through AA<sub>20</sub> or a subsequence thereof comprising at least five amino acids, wherein:

AA<sub>1</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan;

AA<sub>2</sub> is selected from the group consisting of glutamine, asparagine, glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>3</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>4</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>5</sub> is selected from the group consisting of cysteine, alanine, leucine, isoleucine, methionine and valine;

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AA<sub>6</sub> is glycine or alanine;

AA<sub>7</sub> is selected from the group consisting of histidine, glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>8</sub> is selected from the group consisting of proline, alanine and serine;

AA<sub>9</sub> is proline;

AA<sub>10</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan;

AA<sub>11</sub> is selected from consisting of histidine, glutamine, asparagine, glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>12</sub> is glycine or alanine;

AA<sub>13</sub> is selected from the group consisting of glutamine, asparagine, glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>14</sub> is selected from the group consisting of asparagine, glutamine, glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl,

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aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>15</sub> is selected from the group consisting of asparagine, glutamine, glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>16</sub> is selected from the group consisting of asparagine, glutamine, glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>17</sub> is selected from the group consisting of asparagine, glutamine, glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>18</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>19</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan;

AA<sub>20</sub> is selected from the group consisting of histidine glutamic acid, and an aliphatic, substituted

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aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid.

18 (Currently Amended). The method peptide of Claim 17 wherein the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence thereof corresponds to the sequence of the HJ loop of protein kinase C (SEQ ID NO.: 3) or a subsequence thereof, with the proviso that any one amino acid in the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence thereof can vary.

19 (Currently Amended). The method peptide of Claim 17 wherein the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence thereof corresponds to a sequence or a subsequence of the HJ loop of protein kinase C (SEQ ID NO.: 3), with the proviso that any one amino acid in the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence thereof can vary.

20 (Currently Amended). The method peptide of Claim 18 or Claim 19 wherein the peptide comprises an eight amino acid subsequence of the sequence A<sub>4</sub> AA<sub>1</sub> through AA<sub>20</sub>, wherein the subsequence is selected from the group consisting of AA<sub>3</sub> through AA<sub>10</sub>, AA<sub>7</sub> through AA<sub>14</sub> and AA<sub>11</sub> through AA<sub>18</sub>.

21 (Currently Amended). A method in accordance with Claim 42, wherein said peptide comprises comprising a sequence of amino acids AA<sub>1</sub> through AA<sub>20</sub> or a subsequence thereof comprising at least five amino acids, wherein:

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AA<sub>1</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan;

AA<sub>2</sub> is lysine or ornithine;

AA<sub>3</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>4</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>5</sub> is selected from the group consisting of arginine, N-nitroarginine,  $\beta$ -cycloarginine,  $\gamma$ -hydroxyarginine, amidinocitruline and 2-amino-4-guanidinobutanoic acid;

AA<sub>6</sub> is glycine or alanine;

AA<sub>7</sub> is histidine;

AA<sub>8</sub> is serine or threonine;

AA<sub>9</sub> is proline;

AA<sub>10</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan;

AA<sub>11</sub> is selected from the group consisting of arginine, N-nitroarginine,  $\beta$ -cycloarginine,  $\gamma$ -hydroxyarginine, amidinocitruline and 2-amino-4-guanidinobutanoic acid;

AA<sub>12</sub> is selected from the group consisting of glutamine, asparagine, glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl,

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aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>13</sub> is histidine;

AA<sub>14</sub> is lysine or ornithine;

AA<sub>15</sub> is serine or threonine;

AA<sub>16</sub> is lysine or ornithine;

AA<sub>17</sub> is selected from the group consisting of glutamine, asparagine, glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>18</sub> is lysine or ornithine;

AA<sub>19</sub> is histidine; and

AA<sub>20</sub> is selected from the group consisting of glutamine, asparagine, glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid.

22 (Currently Amended). The method peptide of Claim 21, wherein the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence thereof corresponds to the sequence of the HJ loop of bARK1.2 (SEQ ID NO:4) or a subsequence thereof, with the proviso that any two amino acids in the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence thereof can vary.

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23 (Currently Amended). The method peptide of Claim 21, wherein the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence thereof corresponds to the sequence or a subsequence of the HJ loop of bARK1.2 (SEQ ID NO:4), with the proviso that any two amino acids in the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence thereof can vary.

24 (Currently Amended). The method peptide of Claim 22 or Claim 23 wherein the peptide comprises an eight amino acid subsequence of the sequence A<sub>4</sub> AA<sub>1</sub> through AA<sub>20</sub>, wherein subsequence is selected from the group consisting of AA<sub>3</sub> through AA<sub>10</sub>, AA<sub>7</sub> through AA<sub>14</sub> and AA<sub>11</sub> through AA<sub>18</sub>.

25 (Currently Amended). A method in accordance with Claim 42, wherein said peptide comprises comprising a sequence of amino acids AA<sub>1</sub> through AA<sub>20</sub> or a subsequence thereof comprising at least five amino acids, wherein:

AA<sub>1</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan;

AA<sub>2</sub> is selected from the group consisting of glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>3</sub> is selected from the group consisting of leucine isoleucine, methionine and valine;

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AA<sub>4</sub> is selected from the group consisting of leucine isoleucine, methionine and valine;

AA<sub>5</sub> is selected from the group consisting of cysteine, serine and threonine;

AA<sub>6</sub> is glycine or alanine;

AA<sub>7</sub> is selected from the group consisting of arginine, N-nitroarginine,  $\beta$ -cycloarginine,  $\gamma$ -hydroxyarginine, N-amidinocitruline, 2-amino-4-guanidinobutanoic;

AA<sub>8</sub> is selected from the group consisting of leucine isoleucine, methionine and valine;

AA<sub>9</sub> is proline;

AA<sub>10</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan;

AA<sub>11</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan;

AA<sub>12</sub> is asparagine or glutamine;

AA<sub>13</sub> is asparagine or glutamine;

AA<sub>14</sub> is selected from the group consisting of aspartic acid, glutamic acid and an aliphatic, substituted aliphatic, aromatic, substituted aromatic acid, benzylic or substituted benzylic ester of aspartic acid or glutamic acid;

AA<sub>15</sub> is selected from the group consisting of lysine, ornithine and histidine;

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AA<sub>16</sub> is selected from the group consisting of aspartic acid, glutamic acid and an aliphatic, substituted aliphatic, aromatic, substituted aromatic acid, benzylic or substituted benzylic ester of aspartic acid or glutamic acid;

AA<sub>17</sub> is selected from the group consisting of arginine, N-nitroarginine,  $\beta$ -cycloarginine,  $\gamma$ -hydroxyarginine, N-amidinocitruline, 2-amino-4-guanidinobutanoic, lysine and ornithine;

AA<sub>18</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>19</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan;

AA<sub>20</sub> is selected from the group consisting of aspartic acid, glutamic acid and an aliphatic, substituted aliphatic, aromatic, substituted aromatic acid, benzylic or substituted benzylic ester of aspartic acid or glutamic acid.

26 (Currently Amended). The method peptide of Claim 25 wherein the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence thereof corresponds to the sequence of the HJ loop of Akt/PKB (SEQ ID NO.: 7) or a subsequence thereof, with the proviso that any two amino acids in the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence thereof can vary.

27 (Currently Amended). The method peptide of Claim 25 wherein the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence

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thereof corresponds to the sequence or a subsequence of the HJ loop of Akt/PKB (SEQ ID NO.: 7), with the proviso that any one amino acid in the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence thereof can vary.

28 (Currently Amended). The method peptide of Claim 26 or Claim 27 wherein the peptide comprises an eight amino acid subsequence of the sequence A<sub>4</sub> AA<sub>1</sub> through AA<sub>20</sub>, wherein the subsequence is selected from the group consisting of AA<sub>3</sub> through AA<sub>10</sub>, AA<sub>7</sub> through AA<sub>14</sub> and AA<sub>11</sub> through AA<sub>18</sub>.

29 (Currently Amended). A method in accordance with Claim 42, wherein said peptide comprises comprising a sequence of amino acids AA<sub>1</sub> through AA<sub>20</sub> or a subsequence thereof comprising at least five amino acids, wherein:

AA<sub>1</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan;

AA<sub>2</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>3</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>4</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>5</sub> is selected from the group consisting of glutamine, leucine, isoleucine, methionine and valine;

AA<sub>6</sub> is glycine or alanine;

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AA<sub>1</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan;

AA<sub>2</sub> is proline;

AA<sub>3</sub> is proline;

AA<sub>10</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan;

AA<sub>11</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan;

AA<sub>12</sub> is selected from the group consisting of asparagine, glutamine, glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>13</sub> is selected from the group consisting of asparagine, glutamine, glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>14</sub> is selected from the group consisting of asparagine, glutamine, glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

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AA<sub>15</sub> is selected from the group consisting of asparagine, glutamine, glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>16</sub> is histidine;

AA<sub>17</sub> is selected from the group consisting of arginine, N-nitroarginine,  $\beta$ - cycloarginine,  $\gamma$ -hydroxyarginine, amidinocitruline, 2-amino-4-guanidinobutanoic acid lysine and ornithine;

AA<sub>18</sub> is selected from the group consisting of lysine, ornithine, leucine, isoleucine, methionine and valine;

AA<sub>19</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan; and

AA<sub>20</sub> is selected from the group consisting of glutamine, asparagine, glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid.

30 (Currently Amended). The method peptide of Claim 29 wherein the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence thereof corresponds to the sequence of the HJ loop of calmodulin dependent kinase (SEQ ID NO.: 5 ) or a subsequence

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thereof, with the proviso that any two amino acids in the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence thereof can vary.

31 (Currently Amended). The method peptide of Claim 29 wherein the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence thereof corresponds to the sequence or a subsequence of the HJ loop of calmodulin dependent kinase (SEQ ID NO.: 5), with the proviso that any one amino acid in the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence thereof can vary.

32 (Currently Amended). The method peptide of Claim 30 or Claim 31 wherein the peptide comprises an eight amino acid subsequence of the sequence AA<sub>2</sub> AA<sub>1</sub> through AA<sub>20</sub>, wherein the subsequence is selected from the group consisting of AA<sub>3</sub> through AA<sub>10</sub>, AA<sub>7</sub> through AA<sub>14</sub> and AA<sub>11</sub> through AA<sub>18</sub>.

33 (Currently Amended). A method in accordance with Claim 42, wherein said peptide comprises comprising a sequence of amino acids AA<sub>1</sub> through AA<sub>20</sub> or a subsequence thereof comprising at least five amino acids, wherein the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence thereof corresponds to the sequence of the HJ loop of polo (SEQ ID NO.: 6) or a subsequence thereof, with the proviso that any two amino acids in the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence thereof can vary.

34 (Currently Amended). A method in accordance with Claim 42, wherein said peptide comprises comprising a sequence

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of amino acids AA<sub>1</sub> through AA<sub>20</sub> or a subsequence thereof comprising at least five amino acids, wherein the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence thereof corresponds to the sequence or a subsequence of the HJ loop of polo (SEQ ID NO.: 6), with the proviso that any one amino acid in the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence thereof can vary.

35 (Currently Amended). The method peptide of Claim 33 or Claim 34, wherein the peptide comprises an eight amino acid subsequence of the sequence AA<sub>4</sub> AA<sub>1</sub> through AA<sub>20</sub>, wherein the subsequence is selected from the group consisting of AA<sub>2</sub> through AA<sub>10</sub>, AA<sub>7</sub> through AA<sub>14</sub> and AA<sub>11</sub> through AA<sub>18</sub>.

36 (Currently Amended). A method in accordance with Claim 42, wherein said peptide comprises comprising a sequence of amino acid residues AA<sub>1</sub> through AA<sub>20</sub> or a subsequence thereof comprising at least five amino acid residues, wherein:

AA<sub>1</sub> is alanine or glycine;

AA<sub>2</sub> is glutamic acid, aspartic acid or an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>3</sub> is leucine, isoleucine, methionine or valine;

AA<sub>4</sub> is leucine, isoleucine, methionine or valine;

AA<sub>5</sub> is leucine, isoleucine, methionine or valine;

AA<sub>6</sub> is glycine or alanine;

AA<sub>7</sub> is asparagine or glutamine;

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AA<sub>8</sub> is proline;

AA<sub>9</sub> is leucine, isoleucine, methionine or valine;

AA<sub>10</sub> is tyrosine, phenylalanine and tryptophan;

AA<sub>11</sub> is proline;

AA<sub>12</sub> is glycine or alanine;

AA<sub>13</sub> is aspartic acid, glutamic acid or an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of aspartic acid or glutamic acid;

AA<sub>14</sub> is serine or threonine;

AA<sub>15</sub> is glycine or alanine;

AA<sub>16</sub> is leucine, isoleucine, methionine or valine;

AA<sub>17</sub> is glutamic acid, aspartic acid or an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>18</sub> is asparagine or glutamate;

AA<sub>19</sub> is leucine, isoleucine, methionine or valine;

and

AA<sub>20</sub> is leucine, isoleucine, methionine or valine.

37 (Currently Amended). The method peptide of Claim 36, wherein the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence thereof corresponds to the sequence of the HJ loop of GSK3 (SEQ ID NO.: 12) or a subsequence thereof, with the proviso that any two amino acids in the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence thereof can vary.

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38 (Currently Amended). The method peptide of Claim 36, wherein the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence thereof corresponds to the sequence or a subsequence of the HJ loop of GSK3 (SEQ ID NO.: 12), with the proviso that any one amino acid in the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence thereof can vary.

39 (Currently Amended). The method peptide of Claim 37 or Claim 38, wherein the peptide comprises an eight amino acid subsequence of the sequence A1 through AA<sub>20</sub>, wherein the subsequence is selected from the group consisting of AA<sub>3</sub> through AA<sub>10</sub>, AA<sub>7</sub> through AA<sub>14</sub> and AA<sub>11</sub> through AA<sub>18</sub>.

40-41 (Canceled).

42 (Original). A method of modulating the activity of a serine/threonine kinase in a subject, comprising administering a therapeutically effective amount of a peptide comprising a peptide derivative of the HJ loop of a serine/threonine kinase, wherein:

- a) said peptide has between about five and about twenty amino acids or amino acid analogs; and
- b) said peptide modulates activity of the serine/threonine kinase.

43 (New). The method in accordance with claim 42, wherein the peptide is linear.

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44 (New). The method in accordance with claim 43,  
wherein either or both the N-terminus or the C-terminus of  
said peptide is substituted.

45 (New). The method in accordance with claim 44,  
wherein the N-terminus is amidated and the C-terminus is  
acylated.

46 (New). The method in accordance with claim 43,  
wherein the serine/threonine kinase is a member of the polo  
serine/threonine kinase family.

47 (New). The method in accordance with claim 46,  
wherein the serine/threonine kinase is a member of the polo  
family and is selected from the group consisting of Plk, Snk  
and Sak.

48 (New). The method in accordance with claim 43,  
wherein the peptide is represented by a sequence or a  
subsequence of said HJ loop, wherein the subsequence has at  
least about five amino acids.

49 (New). The method in accordance with claim 43,  
wherein the peptide has the sequence of J-42 (SEQ ID NO.: 15),  
J-43 (SEQ ID NO.: 16), J-43.1 (SEQ ID NO.: 17), J-45 (SEQ ID  
NO.: 18) or J-46 (SEQ ID NO.: 19).

50 (New). The method in accordance with claim 42,  
wherein said peptide consists of about twenty amino acids, AA<sub>1</sub>

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through AA<sub>20</sub>, or a subsequence thereof comprising at least five amino acids, wherein:

AA<sub>1</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan;

AA<sub>2</sub> is selected from the group consisting of serine and threonine;

AA<sub>3</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>4</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>5</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>6</sub> is glycine or alanine;

AA<sub>7</sub> is selected from the group consisting of arginine, N-nitroarginine,  $\beta$ -cycloarginine,  $\gamma$ -hydroxyarginine, amidinocitruline, 2-amino-4-guanidinobutanoic acid lysine and ornithine;

AA<sub>8</sub> is proline;

AA<sub>9</sub> is proline;

AA<sub>10</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan;

AA<sub>11</sub> is selected from the group consisting of asparagine, glutamine, glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl,

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aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>12</sub> is serine or threonine;

AA<sub>13</sub> is serine or threonine;

AA<sub>14</sub> is selected from the group consisting of cysteine, serine and threonine;

AA<sub>15</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>16</sub> is lysine or ornithine;

AA<sub>17</sub> is selected from the group consisting of glutamine, asparagine, glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>18</sub> is serine or threonine;

AA<sub>19</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan; and

AA<sub>20</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine.